

AutoTrackRaymarine

by Douwe Fokkema

- [Github Repository](#)
- [Cruiser Forum Thread](#) AutoTrackRaymarine_pi Remote control and route following for Evolution pilots

Will provide remote control of a Raymarine Evolution autopilot from OpenCPN and route following for complex routes from start to finish.

So you make up your route in OpenCPN. Activate it. Cast off. Put the ship on course. Press Auto on the Raymarine P70 pilot head. Pilot takes over as usual. Press auto again: the plugin takes control of the autopilot and will steer your ship along the activated route to your destination. Following the route with a margin (XTE) normally less than 2 meters, independent of cross currents and compass errors. Only thing to do is keep a lookout for obstacles and traffic. As soon as you press Standby the autopilot returns to standby and you can steer manually again. When you press one of the buttons +/- 1 or 10, pilot will switch to regular auto on the last heading plus the button you pressed. Auto button when pilot is in auto activates the tracking again.

Alternatively this may be handled from the plugin window on the OpenCPN screen, see attached image.

The Auto, Standby and +/- buttons work as usual with your Evolution pilot. On top of this comes the Tracking button which is enabled only when a route is active. It will make you follow the active route as described below. Buttons are large for easy use on touch screens.

Currently this is a beta version. The user interface needs some improvements, I am trying to get used to the wxFormBuilder. To use the plugin you need an Actisense NGT-1 to connect to the Raymarine Raytalking network, which is an nmea 2000 network with lots of proprietary pgn's. Some of these I have decoded to get access to the required functions. The current code (Windows only) can be found at https://github.com/douwefokkema/AutoTrackRaymarine_pi. To my regret, the this plugin requires some updates in OpenCPN to function properly. The present version of O provides the XTE (the source for our steering) in nm with 3 decimals. This accuracy is insufficient, we need at least 5 decimals, though the real accuracy is limited by the GPS. And to avoid unexpected behavior at activation we need to set the XTE to zero, I have added that function to the plugin manager. For these modifications in OpenCPN I have submitted a PR, pending. In the meantime I use my own version, at <https://github.com/douwefokkema/OpenCPN-1>

If you want to try this plugin, at <https://www.dropbox.com/sh/7j3vs6s9l...TMymjgSa?dl=0> you will find: - opencpn.exe, the compiled version, replace your opencpn.exe with this one. - the installer for AutoTrackRaymarine_pi or if you prefer - AutoTrackRaymarine_pi.dll

In preferences, set the serial port number of your Actisense NGT-1. You may forget about the rest. For the technically interested, the plugin is using a PID based steering function that calculates corrections on the Bearing to Waypoint (BTW) based on the XTE as received from OpenCPN. It normally sticks to the route within 2 meters, on heading changes at waypoints it may overshoot a little. With large compass errors or strong cross currents, it may take a minute or so to settle down on the track.

This plugin was inspired by and may use code from autopilot_route_pi, Autopilot-Plugin and Canboat (for controlling the Actisense NGT-1).

Warning: this plugin may take full control of your autopilot. In case of system or software errors be ready to switch the autopilot off (never happened).

Feb 9, 2020 CF Post

CF Post #9 I have two reasons to control the autopilot from my computer, and specifically from OpenCPN. My arguments apply specifically to my Raymarine Evolution pilot, communicating with Raytalk ng which is NMEA2000.

1. I want a remote control with the possibility to set the autopilot to Auto/Standby and to adjust the heading set. The wireless remote control that Raymarine provides is too expensive and rather old fashioned, connected through the old Seataalk with a converter that caused all kinds of problems.
2. The Track function on the autopilot is difficult or impossible to use with OpenCPN. It needs data from O, but whatever you send it, after some time it switches off with a "No data" message. I have the impression it requires a Raymarine display to function.
3. When the Raymarine track function does work, it behaves very erratically at startup, steering crazy headings for some minutes, then stabilizing on the right track. Further it requires confirmation at every waypoint, which is not practical when you have routes with hundreds of waypoints often very close together.

To do a better job one needs to control the autopilot for at least the following functions: set heading, set auto/standby. I have decoded the communication of the autopilot with the pilot head and deciphered the proprietary pgn's that perform these functions. With this I have build a plugin for O that provides a remote control for the autopilot and a route following function. The plugin is using a Actisense NGT-1 for the communication with the NMEA2000 network of Raymarine. The plugin is also monitoring the keystrokes on the Raymarine P70 pilot head and acts on that to activate the route following. The current version of the plugin does however not function (yet) with the released version of O, it needs a higher version of the plugin API in O which is already in O master, coming out in next release. Further details on this plugin: <https://www.cruisersforum.com/forums...ts-225322.html>. I will have a updated version of this plugin available before summer.

Douwe Fokkema

Note: The PGN's I am using to control the Raymarine pilot are proprietary and don't have nmea183 equivalents. So I don not see how a Signalk server can do a conversion. Further I have no need of a conversion, my plugin is working and tested during a full sailing season. To follow a route I do not need the full route in the plugin. I just use the DTW, BTW and XTE for the current leg, that is sufficient to steer on track. Reason I needed an update in O is that the accuracy of the XTE in the nmea183 message lacks precision. I want to steer within meters from the track, limited only by the accuracy provided by the GPS

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